



Entergy Nuclear Operations, Inc.
600 Rocky Hill Road
Plymouth, MA 02360

Pilgrim Nuclear Power Station

December 21, 2012

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No.: 50-293
License No.: DPR-35

Licensee Event Report 2011-007-01, Safety Relief Valve Declared Inoperable Due to Leakage

LETTER NUMBER: 2.12.090

Dear Sir or Madam:

The enclosed Supplement Licensee Event Report (LER) 2011-007-01, "Safety Relief Valve Declared Inoperable Due to Leakage" is submitted in accordance with 10 CFR 50.73.

This letter contains no commitments.

Please do not hesitate to contact Mr. Joseph R. Lynch, (508) 830-8403, if there are any questions regarding this submittal.

Sincerely,

A handwritten signature in cursive script that reads "Ralph A. Dodds, III".

Ralph A. Dodds, III
Director, Nuclear Safety Assurance

Attachment 1: Licensee Event Report 2011-007-01, Safety Relief Valve Declared Inoperable Due to Leakage (4 pages)

TEZZ
NRR



cc: Mr. William M. Dean
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USNRC Senior Resident Inspector
Pilgrim Nuclear Power Station

Attachment 1
Letter Number 2.12.090

Licensee Event Report 2011-007-01

Safety Relief Valve Declared Inoperable Due to Leakage

(4 Pages)

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Pilgrim Nuclear Power Station

2. DOCKET NUMBER

05000293

3. PAGE

1 OF 4

4. TITLE

Safety Relief Valve Declared Inoperable Due to Leakage

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVNO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	26	2011	2011	007	01	12	21	2012	N/A	

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
N	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
10. POWER LEVEL	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> OTHER
	Specify in Abstract below or in NRC Form 366A			

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Joseph R. Lynch, Licensing Manager

TELEPHONE NUMBER (Include Area Code)

(508)-830-8403

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	SB	RV	T020	Yes					

14. SUPPLEMENTAL REPORT EXPECTED

☐ (If yes, complete 15. EXPECTED SUBMISSION DATE ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On Monday, December 26, 2011, at 1250 hours, with the reactor at 100% core thermal power, the station entered a 24-hour action statement to initiate a controlled shutdown and be less than 104 psig reactor pressure due to suspected leakage across the first stage of safety relief valve (SRV) RV-203-3D. The SRV was declared inoperable due to criteria specified in a Pilgrim plant procedure. Specifically, the SRV is inoperable if the pilot stage thermocouple temperature is 35° F below its baseline temperature. The safety relief valve was declared inoperable and the Limiting Condition for Operation (LCO) for Technical Specification (TS) 3.6.D was entered. Due to the valve being declared inoperable, the station was required to be shutdown and reactor coolant pressure be below 104 psig within 24 hours per TS 3.6.D.2.

Following the shutdown, RV-203-3D was repaired with a new pilot valve and the plant was returned to full power operation.

This event had no impact on the health and/or safety of the public.

**LICENSEE EVENT REPORT (LER)
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NARRATIVE**EVENT DESCRIPTION:**

On December 26, 2011 at 10:46 EST while operating at 100% power, the near tailpipe temperature for safety relief valve (SRV) RV-203-3D increased from an ambient temperature approximately 160°F to greater than 200°F. A review of thermocouples installed in RV-203-3D confirmed a pilot stage (first stage) leak resulting in the valve being declared inoperable and an unplanned LCO entry leading to a plant shutdown.

The Pilgrim Nuclear Reactor Pressure Vessel Relief System consists of four safety relief valves (SRVs) and two spring safety valves (SSVs). During Refueling Outage (RFO-18), in April/May, 2011, the four SRVs were replaced with Target Rock Model 0867F 3-stage SRVs.

To monitor these valves for leakage, Pilgrim installed thermocouples at the pilot (first stage), at the second stage, on the tailpipe near the valve (4.5' to 6' away), on the tailpipe far from the valve (approximately 20' away) and at the pilot bellows. Procedure 2.2.23, "Automatic Depressurization System", provides guidance for interpreting the thermocouple outputs and determination of valve operability based in part on data by Target Rock.

On December 26, 2011, the Control Room received alarm "Relief/Safety Valve Leaking (C903L-A2)". The pilot stage temperature decreased by 65°F from its baseline temperature and the second stage temperature decreased by approximately 10°F. Based on the Target Rock data, this indicated that there was leakage that required repair of the SRV.

The safety relief valve was subsequently declared inoperable and the Limiting Condition for Operation (LCO) for Technical Specification (TS) 3.6.D was entered. Due to the valve being declared inoperable, the station was required to be shutdown and reactor coolant pressure below 104 psig within 24 hours per TS 3.6.D.2.

ROOT CAUSE OF EVENT:

On March 21, 2012, the pilot assembly and second stage were disassembled. Measurements and tests were performed at various stages of the disassembly. Photographs were taken of the components as necessary. To determine the root cause, a joint team of Wyle Laboratories, Target Rock, Entergy and Southern Nuclear Operating Company engineering staff worked together to disassemble and inspect the pilot and second stage of the valve.

The inspection and disassembly of the pilot valve determined that there is no conclusive root cause for the leakage of the pilot valve.

The following observations were made during the inspection and disassembly observations:

1. There was no evidence of a design defect that could be the root cause for the onset of leakage. The basic design of this 3-stage valve is mature and had been in operation since 1970. Adherence to design and specification parameters were certified by witnessed steam tests before the valve left the Target Rock (TR) factory. The valves were assembled and tested under TR's ASME Section III, 'NV' stamp. The pilot assembly and second stage assembly were steam tested at TR to confirm steam pressure within 1% of 1155 psig and shown to be leak tight at 1055 psig (91%).

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2. There was no evidence of material defect that could be a root cause for the onset of leakage. All components were found to be structurally sound. The only damage observed was the seat cutting that resulted from a pilot stage steam leakage described earlier.
3. There was no evidence of a defect in workmanship that could be considered a root cause for the onset of leakage, including bellows run out and preload gap.

In conclusion, the as-found tests and inspections could find no evidence of a defect in design, material, or workmanship that could lead to the onset of leakage. The pilot and second stage were leaking as-received at the TR facility and the as-found condition of both the pilot and second stage disc/seat was directly attributable to the installed plant leakage. The tests and inspections did not conclude any direct cause for the leakage.

CONTRIBUTING CAUSES OF EVENT:

There are no contributing causes identified as a result of the evaluation.

EXTENT OF CONDITION:

The identified condition is a leaking SRV pilot. Based on a review of plant data, the only pilot to exhibit signs of leakage is RV-203-3D. The leaking pilot has been replaced. No additional pilots have this condition at this time. Any corrective actions that are identified to prevent reoccurrence of leaking SRV pilots will be applied to all four SRVs.

CORRECTIVE ACTIONS:

The following corrective actions were completed.

The pilot stage of RV-203-3D was removed. The pilot from another valve assembly which was verified to be leak tight was used.

No additional corrective actions are recommended based upon the results of the testing, inspection, and evaluation of the leaking pilot from RV-203-3D by a joint team of Wyle Laboratories, Target Rock, and Entergy Engineering.

ASSESSMENT OF SAFETY CONSEQUENCES:

The leaking SRV and the plant shutdown to repair the SRV in accordance with Technical Specification 3.6.D.2 posed no threat to the public health and safety.

All leakage from the valve was collected in plant systems, primarily the torus, and processed in accordance with normal station practices.

Pilgrim designed the SRVs and the installed temperature monitoring to provide sufficient indication of SRV leakage so that appropriate actions can be taken to ensure that the plant is maintained in a safe condition.

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Procedure 2.2.23 provides the instructions and guidance for interpreting and responding to SRV temperature indications. Based on these instructions, the plant was shutdown before the leakage could increase to the point that the valve might self-actuate. Because the leakage established by procedure did not affect the SRV set pressure or capacity, the SRV would have been able to respond if needed to meet its core cooling or reactor pressure vessel overpressure protection functions.

PREVIOUS OCCURRENCES:

There are no previous first stage leakage occurrences with these safety relief valves since all four Safety Relief Valves were newly installed in April/May, 2011, during Refueling Outage 18.

However, industry has experienced leakage with other Target Rock Model safety relief valves at other plants.

OE26394 & OE26892 - Planned Shutdown due to a Safety Relief Valve Leak - Peach Bottom Unit 3

OE33766 - Three Stage Safety Relief Valve Pilot Leakage just below Normal Operating Pressure – Plant Hatch

OE32805 – Safety Relief Valve Temperature Phenomenon – Fitzpatrick

OE34730 – Target Rock 3 Stage Main Steam SRV Bore to Seat Misalignment – Limerick 2

OE19219 – Plant Shutdown Due to Increasing Tailpipe Temperature – Duane Arnold

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIIS) CODES:**COMPONENTS**

Valve, Relief

CODES

RV

SYSTEMS

Main Steam

SB

REFERENCES:

Condition Report CR-PNP-2011-5870, Safety Relief Valve RV-203-3D, Pilot Leak Root Cause Evaluation Report